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Positioning and Ergonomics for Pregnant Women While Performing Daily Tasks

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Positioning and Ergonomics for Pregnant Women While
Performing Daily Tasks

A Scholarly Project

by

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Brandi Johnson, MOTS

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

Master in Occupational Therapy

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CHAPTER I: Introduction

Pregnant women are an emerging population requiring education on proper positioning and body mechanics inside and outside of the home. This education is pivotal to increase the duration of hours worked and the health and safety of the pregnant woman and her fetus. The workforce in the United States is composed of 46% women, 68% of these women are of childbearing, age 16-44 years old, and 68% have at least one child under the age of 18. Each year in the United States, approximately 15% of the births are considered high risk secondary to maternal or fetal complications which may be caused by working conditions of the pregnant woman (Cannon, Schmidt, Cambardella & Browne, 2000).

Pregnant women and their employers are not thoroughly educated in areas regarding ergonomics, body mechanics, positioning and energy conservation. Ergonomics and positioning in pregnancy is a field of occupational therapy practice which has limited literature documenting the outcomes. More literature is found on ergonomics in general and this data can be incorporated to assist women in maintaining productivity while pregnant.

The focus of the study was to use positioning and ergonomics principles for pregnant women while performing daily tasks. Information from the literature review and other sources was brought together to devise an educational packet.

Chapter two consists of a comprehensive literature review; chapter three and four describe the development of the educational packet and chapter five describes areas for future research. The complete educational packet can be found in Appendix A.

CHAPTER II: Review of Literature

The workforce in the United States is composed of 46% women, 68% of these women are of childbearing age, 16-44 years old, and 68% have at least one child under the age of 18. Each year in the United States, approximately 15% of the births are considered high risk secondary to maternal or fetal complications which may be caused by working conditions of the pregnant woman (Cannon, et al., 2000). Considering these statistics, pregnant women are a population requiring education on proper positioning and body mechanics inside and outside of the home. This education may assist in increasing the duration of hours that can be worked and promoting the health and safety of the pregnant woman and her fetus.

Education not only benefits the pregnant woman, but also the woman's family and employer. By increasing the employer's knowledge of pregnancy and the risks associated with employment while pregnant, the employer may have a better understanding of the importance of proper positioning at work, paid maternity leave and health benefits (Cannon et al., 2000). Education provides the employer with a better understanding of correct positioning, ergonomics, energy conservation and adjusted work hours which may lead to increased hours worked, productivity and stable revenue for the employer. Ergonomics is fitting the job to the worker's abilities, or more specifically, modifying the job requirements to compliment the worker and prevent unnecessary injuries (Hedge, 2001). Energy conservation is used to aid the worker in reducing fatigue while carrying out tasks. Providing early education to employers and pregnant women regarding important ergonomic, energy conservation and positioning techniques will

allow for prevention of injury. The prevention perspective provides proper education, increased safety and overall health, rather than treating injuries as a result of poor positioning and ergonomics.

A way to prevent injuries is to consult an occupational therapist who is a medical professional appropriate for educating pregnant women, their families and employers. An occupational therapist has skills to complete job assessments at the work place and in the home environment related to pregnancy and task completion. This professional is able to recognize potential risk factors in the pregnant worker and the work environment, provide early intervention, assist the woman in following through with a variety of protocols and provide resources to her. According to Cannon et al., (2000), occupational therapists “also have current knowledge and an ability to assist employees to safely continue employment while addressing the issues surrounding pregnancy... by listening, providing support, providing education, and referring employers to benefits and human resources representatives” (p.436). This literature review will address changes occurring in the pregnant woman and her fetus during pregnancy, typical complaints and pains throughout pregnancy, recommended positioning and ergonomics while carrying out daily tasks, the roles of pregnant women, and the role of the occupational therapist through interventions.

Changes of Pregnancy:

The pregnant woman will experience numerous physical changes during the nine months of pregnancy. During the first trimester the woman may start to experience morning sickness, an increase in breast size and sensitivity. The pregnant woman may start to show she is pregnant by the end of the first trimester (Antonelli, 2003).

Throughout the second trimester the baby begins to move about inside the women. In addition to this, the pregnant women may begin to notice weight gain, water retention and heart burn. At this point in the pregnancy the uterus becomes about the size of a football (Antonelli, 2003).

By the third trimester the baby repositions itself in the head down position readying for birth. At this point the pregnant women may experience back pain, feelings of faintness after standing for long periods of time and an unsteady balance due to the increase in abdominal size. Women frequently experience increased difficulty in carrying out daily tasks during the third trimester (Gilleard, Crosbie & Smith, 2002a).

Hormones, specifically progesterone and relaxin, are being released which causes the pelvis and ligaments to soften and relax. This causes the joints to become more elastic, making the pelvis more capable of facilitating birth. This instability may cause a feeling of imbalance and may increase the likelihood of a miscarriage when involved in rigorous activity (Antonelli, 2003).

During the time progesterone and relaxin are being released, the uterus is also tipping forward, expanding the rectus abdominus muscles. The woman's center of gravity shifts forward, making her want to lean backwards to accommodate for the shift of gravity. This places more strain where the pelvis meets the spine, increasing the lumbar lordosis and as a result causing lower back pain. Other causes of lower back pain may include back pain prior to pregnancy or pain related to work. Women with history of back pain are more likely to have recurrent episodes lasting up to 18 months post partum (Poole, 1998). The number of women experiencing back pain and fatigue is fairly high. Paul and Frings-Dresen (1994) state that approximately 50% of pregnant women

experience low back pain and 67% of pregnant women complain of significant to severe fatigue.

As a result of physical changes in a pregnant woman's body, daily tasks become increasingly more difficult. Difficulties experienced by pregnant women include: picking things up from the floor, working at a table/desk, driving, climbing stairs, getting into and out of a car and ironing (Poole, 1998). These activities not only affect pregnant women, but also the fetus. Naeye and Peters (1982) report, physical work completed by women during pregnancy may delay fetal development and increase fetal/neonatal mortality. The fetus may experience difficulties while the woman is active due to reduced blood flow from the uterus to the placenta, decreasing the number of calories the fetus is able to attain for essential development (Naeye & Peters).

Positioning & Ergonomics:

Due to the numerous changes women experience during the nine months of pregnancy, proper education on ways to safely carry out tasks is crucial to the well-being of the pregnant woman and the fetus. Pregnancy is a temporary condition and because of this women do not usually obtain education in proper body mechanics through their place of employment or by nurses and physicians (Poole, 1998).

Proper positioning provides support and comfort to the spine to help maintain the proper pelvic angle. As pregnancy progresses the spinal curves become larger and require the muscles to work overtime to keep the spine aligned (Jacobson, 1991). The muscles involved in standing posture include both abdominal muscles and extensors of the trunk. Abdominal muscles may become weak during pregnancy and fail to properly support the uterus and lumbar spine (Jacobson). The abdominal muscles used to support

the pelvis can remain compromised up to eight weeks postpartum (Gilleard, et al., 2002b). During later stages of pregnancy, the increasing size of the lower abdomen and the abdomen's opposition with the thighs may restrict the anterior tilt of the pelvis (Gilleard, et al.).

Pregnant women must find ways to compensate for physiological changes. Women reach by flexing forward at the trunk, which increases the ability to reach forward, but also increases the chance of falling. Women may alter movement patterns to complete daily tasks, such as increased width of the stance, which may accommodate for the center of gravity being further forward and lateral movements of the body. This stance allows her to feel more stable on her feet (Gilleard, et al., 2002a).

Recommendations for pregnant women include following specific posture and position guidelines when resting, at home and at work. The benefits of proper positioning and posture include decreasing lower back pain, relieving stress, improving posture, strengthening the abdominal muscles, increasing blood flow to the fetus and increasing circulation throughout the woman's body (Jacobson, 1991). The increased blood flow to the fetus supplies the child with increased oxygen and nutrients which are vital to development.

It is important for the woman to be aware of her pelvic tilt. A technique to adjust the pelvic tilt of a woman is to look at her profile in the mirror. She can then concentrate on the pelvis having a backwards tilt, using abdominal muscles to keep the anterior portion of the pelvis up while using buttock muscles to keep the posterior pelvis portion pointed downward. This prevents her muscles from weakening further and may limit lower back pain (Jacobson, 1991). Additional techniques to reduce back pain while

standing include, placing one foot on a raised surface to increase the flexion in the knee and hip to minimize the force placed on the lumbar curve (Poole, 1998). The woman should take frequent breaks and make sure the standing work surface is at a proper height. It is recommended the table height should be “2-4 inches below the elbow for light tasks and 4-8 inches below the elbow for manual and more resistive tasks” (Poole, p.160). Tasks that can be completed while one foot is placed on a stool include washing dishes and working as a teller at a bank or a cashier at a department store.

The recommended position for resting and sleeping is lying on her left side in a flexed position with a thin pillow positioned lengthwise between her legs from the thigh to the ankle. The non weight bearing leg should be positioned on top of the pillow in alignment with the leg below the pillow. If the woman is experiencing lower back pain, an additional pillow can be placed between the bed and the side of the abdomen to alleviate this pain. To further achieve relaxation the woman may support her top arm by resting it along side her body and her bottom arm comfortably positioned along side the pillow her head is resting on (Jacobson, 1991).

Hedge (2001) identified that the optimal angle for posture while seated is reclined between 100-110 degrees. This angle reduces the stress placed on the lumbar portion of the spine. It is recommended that women sit in a comfortable chair with armrests and a lumbar support. A foot stool should be used to sustain a proper curve in the lower back. When selecting a chair, a pregnant woman should make a conscious decision to select a chair with armrests because research has indicated “women need a 100% increase in quadriceps muscle force and a 35% increase in hamstring muscle force to rise from a chair when pregnant as apposed to after delivery” (Poole, 1998, p. 158). An armed chair

allows the pregnant woman to use her arms to assist in standing by pushing down on the armrests and decreasing the strain on her legs. It is suggested women stand every 30-40 minutes and walk around if they are sitting for long periods of time on the job or at home. This increase in movement promotes blood flow and circulation to the fetus and the woman's vital organs (Poole). While completing sitting tasks at a desk, the height of the desk needs to be adjusted to between 28"-30" above the floor. The elbow angle should be at or greater than 90 degrees to avoid pinching the nerve at the elbow. It is important to avoid overreaching to reduce the strain on her back. Feet should be placed flat on the floor or on a footrest (Hedge). When sitting in a car, the woman should sit upright and support the lumbar spine to reduce the back strain. Gilleard et al., (2002a), found no significant evidence that pregnancy reduces the woman's ability to complete standing and sitting tasks.

Dynamic activities require pregnant women to be aware of proper body mechanics, appropriate ergonomic techniques and conserving energy. Tips on energy conservation while following through with daily tasks include "(1) sit to work if possible, (2) gather needed items in one area before beginning a task, (3) change positions every 20-30 min and (4) elicit assistance from other family members" (Poole, 1998, p. 160).

Exercise:

Duration, frequency and type of exercise are additional concerns during pregnancy. The frequency suggested for exercise ranges from three times per week (With physician approval...,1994) to most if not all days of the week. The advised duration is approximately 30 minutes or longer, however, not to the point of exhaustion or overheating (Artal & O'Toole, 2003). These authors report all activities are

appropriate to engage in with the exception of contact sports and scuba diving due to heightened risk of injury to the mother or fetus.

Contraindications for aerobic exercise during pregnancy include heart disease; lung disease; soft cervix/cerclage, this is when the woman's cervix is surgically stitched closed to prevent preterm delivery; multiple pregnancy; risk of premature labor; persistent second or third trimester bleeding; placenta praevia, this is when the placenta presents first; delivering before the baby, after 26 weeks gestation, ruptured membranes and pregnancy induced hypertension (Artal & O'Toole, 2003).

Pregnant woman without contraindications can benefit from exercising during pregnancy. Benefits of exercise include better regulation of blood glucose levels, less weight gain, decreased risk of gestational diabetes, improved emotional status (With physician approval..., 1994) shorter labor length, less difficulty with labor pain and less obstetric interventions (Schramm, Stockbauer & Hoffman, 1996).

Despite the stated benefits of exercise it is also important to note potential negative effects of exercise. Exercise during the first few weeks of pregnancy may increase the risk of early pregnancy loss or preterm labor secondary to stimulation of the uterus (Schramm et al., 1996). During the early stages of pregnancy (between days 20 and 65), if women overexert themselves or expose themselves to hazardous situations, such as over exercising or chemical exposure, congenital abnormalities may be formed. Following this time period, women can complete exercise/daily activities with less concern of harming the fetus (Chamberlain, 1993). Exercise causes increased blood flow to the woman's muscles and therefore may reduce the circulation required by the fetus for growth and development. Individuals with pregnancy induced high blood pressure,

preterm rupture of the membranes, preterm labor, or persistent bleeding should not exercise outside of daily activities or tasks (With physician approval..., 1994).

Women's Role:

The role of women in the workplace and the amount of women working in the home has been changing over time. During the past 30 years, women in the workforce has tripled (Luke, Avni, Min & Misiumas, 1999). The age group 20-35 years old has been the area of greatest increase leading to 65% of women in the workforce being of childbearing age (Seguin, 1998). "In fact, the expectation that a woman will marry, work at home, and raise the children while the man supports the family is currently the experience of less than 7 percent of the families in the United States" (DeJoseph, 1993, p. 87). In 1970 50% of women worked outside the home compared with nearly 80% in 1999 (Luke et al.). Of the women working outside the home, two thirds are of childbearing age (Chescheir et al., 2000). By 2005 it is estimated 79 million women will be working in the labor force outside the home (Woo, 1997), and more than 1 million of these women will become pregnant each year (Chescheir et al.). Even though more women are employed outside the home, home maintenance and childcare are still expected from the woman as she returns home from work. DeJoseph (1993) found women are still completing a majority of the household chores compared to their partners, noting on average wives completed 504 minutes and husbands completed 190 minutes of household work per day.

Working while pregnant has several drawbacks. Since the turn of the century, pregnant women have been impacted by working while pregnant. Several studies have concluded that low birth weight, growth retardation and preterm birth are a result of

working in the later stages of pregnancy (Misra, Strobino, Stashinko, Nagey & Nanda, 1998; Schramm et al., 1996).

Naeye and Peters (1982) found the following:

The study found that lower birth weights among mothers who held employment outside their homes than in mothers who remained at home during the last trimester of pregnancy. The growth retardation was most severe when mothers had stand-up jobs, continued working until near term, were hypertensive, or had children at home to care for when they returned from work. (p. 726)

Not all researchers agree that an increase or maintenance in working hours has a negative affect on birth while pregnant. Misra et al. (1998) report in their literature review have found employment, housework or child care have no effect on the risk of preterm birth. An additional study by Chamberlain (1993) found “while there was a correlation of low birth weight with hours worked, this did not persist for preterm delivery” (p. 569).

During later stages of pregnancy, women need to consider proper positioning of work equipment necessary during later stages of pregnancy to avoid risks to the woman and the fetus. Changes made while carrying out her job in positioning, ergonomics and the environment influence the outcome and development of the fetus.

Occupational Therapy Role:

An occupational therapist can assist in devising a plan at the worksite and in the home environment. Occupational therapy services provided to pregnant women may shorten hospital stays, reduce expenses, provide woman with necessary education and

training to maintain their daily roles during pregnancy such as daily home chores and work outside the home.

According to Wooster, Gray and Gifford (2001):

Occupational therapy treatment could consist of activities for building strength and endurance; increasing control over the environment; minimizing psychosocial complications of depression, anxiety, and boredom; promoting relaxation; increasing bed mobility; and adapting the environment to promote independence and engagement in meaningful, purposeful activities. (p. 232)

Environmental modifications in home and work settings may decrease low back pain, carpal tunnel syndrome, difficulties at work and carrying out daily home tasks. The use of adaptive equipment and proper body mechanics may reduce difficulties with tasks and back pain. Education and promoting healthy body awareness is the key in aiding the pregnant woman in modifying her job (Wooster et al., 2001). Additional ways an occupational therapist could provide pregnancy awareness is through workshops, educational pamphlets, and communication with employers to further increase their awareness of the needs of pregnant women. This can prove to be cost effective for the company or employer.

Summary:

As a result of the literature reviewed it was found that positioning and ergonomics while completing ADLs/IADLs were beneficial in decreasing fatigue, preterm labor and lower back pain in pregnant women. Education regarding positioning and ergonomics resulted in an increase in the woman's abilities to work longer hours at home and at the work place. The literature identified overall mood was increased when the woman was

able to remain independent and perform daily work and leisure tasks throughout pregnancy.

Prenatal doctor visits are not always sufficient in educating the pregnant woman regarding positioning and ergonomics throughout their day. Occupational therapists can assist in providing women and employers with additional information regarding job analyses, offer job modifications, ergonomic assessments, provide energy conservation techniques and recommend adaptive equipment if appropriate.

Based on information found in the literature there is a need for a more comprehensive resource for women and employers. The following chapter describes the process of developing an educational packet with information on techniques for pregnant women to use while carrying out activities of daily living at home and in the work place.

CHAPTER III & IV: Methodology and Product

This chapter describes the process of developing the educational packet for pregnant women. Initially, twenty sources, consisting mostly of journal articles, were reviewed and summarized. The focus of the study was narrowed to positioning and ergonomics for pregnant women while performing daily tasks. Prior to writing the literature review an outline was developed which focused on specific aspects of pregnant women and their roles. Once the major areas of focus were decided upon each area was divided into smaller sections to aid in writing the literature review. Information from the literature review and other sources was brought together to devise an educational packet. See Appendix A for complete educational packet.

The educational packet was developed using photographs of a pregnant volunteer to aid the reader in comprehending the proper positions and recommendations. Information obtained from the literature review and the "Occupational Therapy Practice Framework: Domain and Process" (American Occupational Therapy Association, [AOTA], 2002) were condensed and written at a 7th grade reading level with easy-to-read terms to help the reader understand and apply the information.

The "Occupational Therapy Practice Framework: Domain and Process" (AOTA, 2002) provided the organizing structure for the educational packet in defining daily tasks women typically complete. Three main areas were addressed: activities of daily living (ADLs), instrumental activities of daily living (IADLs) and work. ADLs are defined as "activities that are oriented toward taking care of one's own body" (AOTA, 2002, p.33). More physically and cognitively demanding tasks included in a pregnant woman's life involve IADLs, which are defined as "activities that are oriented toward interacting

with the environment and that are often complex- generally optional in nature (i.e., may be delegated to another)” (AOTA, p.34). Work "includes activities needed for engaging in remunerative employment or volunteer activities" (AOTA, p.35).

The educational packet was organized into four sections: activities of daily living, including self care and sexual activity; instrumental activities of daily living, including home tasks, cleaning, caring for others, and exercise; and work activities. A summary section includes: general guidelines, employer considerations, recommendations, restrictions and a list of additional resources.

The educational packet focuses on the pregnant woman particularly in the third trimester, the woman’s family and her employer. According to Seguin (1998) 90% of women are working outside the home into their third trimester and 84% are working into their last month of pregnancy. By increasing pregnant women’s and employer’s knowledge of pregnancy and the risks associated with employment while pregnant, these individuals may have a better understanding of the importance of proper positioning at work, paid maternity leave and the health benefits (Cannon et al, 2000).

CHAPTER V: Summary

As an end result of the literature reviewed it was found education on positioning and ergonomics while completing activities of daily living and/or instrumental activities of daily living was beneficial in decreasing fatigue, preterm labor and lower back pain in pregnant women. This instruction resulted in an increase in the woman's abilities to work longer hours at home and at work.

An occupational therapist has the skills to educate pregnant women regarding positioning and ergonomics throughout their day. This professional can provide women and employers additional information regarding job analyses, job modifications, ergonomic assessments, provide energy conservation techniques and recommend adaptive equipment if appropriate.

Based on information in the literature there was a need to have a more comprehensive resource available to women and employers. An educational packet was developed using photographs of a pregnant woman completing activities of daily living at home and in the work place in order to demonstrate proper techniques. This packet includes recommendations, restrictions, guidelines, external resources and the occupational therapists role in aiding pregnant women.

Recommendations for further research in this area include: information regarding physical activity in pregnancy with women of low socioeconomic status (Misra et al, 1998) and psychosocial aspects (DeJoseph, 1993). More information is needed regarding the roles a woman carries out during pregnancy, the maintenance or quality of the relationship with their partner and the effects counseling has on pregnant women

regarding tasks that compose their daily work (i.e. housework and how daily tasks affect the fetus).

References

- American Occupational Therapy Association. (2002). Occupational therapy practice framework: Domain and process. *American Journal of Occupational Therapy*, 56, 609-639.
- Antonelli, R. (2003). The baby making companion: From preconception to baby's first steps. Retrieved September 3, 2003, from <http://www.quolkids.com/companion/index.asp>
- Artal, R., O'Toole, M. (2003). Guidelines of the American college of obstetricians and gynecologists for exercise during pregnancy and the postpartum period. *British Journal of Sports Medicine*, 37, 6-12.
- Cannon, R.B., Schmidt, J.V., Cambardella, B., & Browne, S. E. (Sept, 2000). High risk pregnancy in the workplace. *AAOHN Journal*, 48(9), 435-449.
- Chamberlain, V.G. (1993). Work in pregnancy. *American Journal of Industrial Medicine*, 23, 559-575.
- Chescheir, N.C., Dattel, B.J., Lurvey, N.L., Meade, S.F., Ramin, S., Riley, L.E. et al. (2000). *Planning your pregnancy and birth* (3rd ed.). The American College of Obstetricians and Gynecologists, Washington, D.C.
- DeJoseph, F.J. (1993). Redefining women's work during pregnancy: Toward a more comprehensive approach. *Birth*, 20, 86-92.
- Gilleard, W., Crosbie, J., & Smith, R. (2002a). Effect of pregnancy on trunk range of motion when sitting and standing. *Acta Obstetricia Et Gynecologica Scandinavica*, 81, 1011-1020.

- Gilleard, W.L., Crosbie, J.C., & Smith, R. (2002b). Static trunk posture in sitting and standing during pregnancy and early postpartum. *Archives of Physical Medicine and Rehabilitation*, 83, 1739-1744.
- Hedge, A. (2003). Ergonomic guidelines for computer workstations – 10 steps for users. Retrieved 8/20/03 from <http://www.spineuniverse.com/displayarticle.php/article1410.html>.
- Jacobson, H. (1991). Protecting the back during pregnancy. *American Association of Occupational Health Nurses Journal*, 39(6), 286-291.
- Luke, B., Avni, M., Min, L., & Misiunas, R. (1999). Work and pregnancy: The role of fatigue and the “second shift” on antenatal morbidity. *American Journal of Obstetrics and Gynecology*, 181, 1172-9.
- Misra, D.P., Strobino, D.M., Stashinko, E.E., Nagey, D.A., & Nanda, J. (1998). Effects of physical activity on preterm birth. *American Journal of Epidemiology*, 147(7), 628-35.
- Naeye, L.R., & Peters, C.E. (1982). Working during pregnancy: Effects on the fetus. *Pediatrics*, 69, 724-727.
- Paul, J.A., & Frings-Dresen, M.H.W. (1994). Standing working posture compared in pregnant and non-pregnant conditions. *Ergonomics*, 37(9), 1563-1575.
- Poole, J.L. (1998). Body mechanics during daily tasks to reduce back pain in women who are pregnant. *Work*, 10, 157-165.

- Schramm, W.F., Stockbauer, J.W. & Hoffman, H.J. (1996). Exercise, employment, other daily activities, and adverse pregnancy outcomes. *American Journal of Epidemiology*, 143(3), 211-218.
- Seguin, E.R. (1998). Pregnancy and the working woman: A review. *The Journal of the Arkansas Medical Society*, 95,3, 115-8.
- Tapp, L. M. (2000). Pregnancy and ergonomics. Retrieved 8/20/03 from <http://www.crownsafety.com/Pregnancy.pdf>.
- With physician approval, pregnant women can still exercise. *OT Week*, February 3, 1994
- Woo, M.G. (1997). Daily demands during pregnancy, gestational age, and birthweight: Reviewing physical and psychological demands in employment and non-employment contexts. *Annals of Behavioral Medicine*, 19(4), 385-397.

Appendix A

Mobile Mommies



Move with Ease during your Pregnancy



By: Kim Anderson, MOTS
Brandi Johnson, MOTS
& Janet Jedlicka, Ph.D., OTR/L

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This educational packet is designed to provide ideas, handy tips and safety options to assist you while you are pregnant. This is not intended to replace any advice received from your physician.

Activities of Daily Living (ADLs)

Self Care Tasks

Self care tasks are those activities you do while taking care of your personal needs. The areas that this section of the packet will describe are: getting into and out of bed, lying in bed, bathing and showering tips and fixing your hair and make-up. The reasons you should know how to get into and out of bed and the way to lie in bed are to decrease muscle stiffness, increase blood flow throughout your body and to keep your body and spine in good position. Tips for showering, bathing and fixing your hair and make-up are listed to keep you and your baby safe. The items shown in the bathing and showering section can be purchased at most local superstores and are designed to decrease your chances of slipping or falling while bathing.

Laying in Bed

Lie on your left side to provide the best blood flow and amount of nutrients to the placenta.



Correct Position Should Include the Following:

- ➡ Bent knees
- ➡ Pillow placed between your knees
- ➡ Optional pillow under top arm to decrease spin twisting.
- ➡ Optional pillow placed under the stomach in later stages of pregnancy to be more comfortable (shown with red line in the picture above).

» **Remember to avoid lying on your back:** this puts too much stress and weight on the spine, intestines and circulatory system which may increase back pain and slow the blood flow which gives you and your baby important nutrients and oxygen.

Potential Effects of Laying in Bed in the Wrong Position

- ➡ Lessen digestive abilities
- ➡ Cause breathing problems
- ➡ Lessen circulation or blood flow
- ➡ Possibly cause high blood pressure
- ➡ Possibly cause low blood pressure

Getting Out of Bed

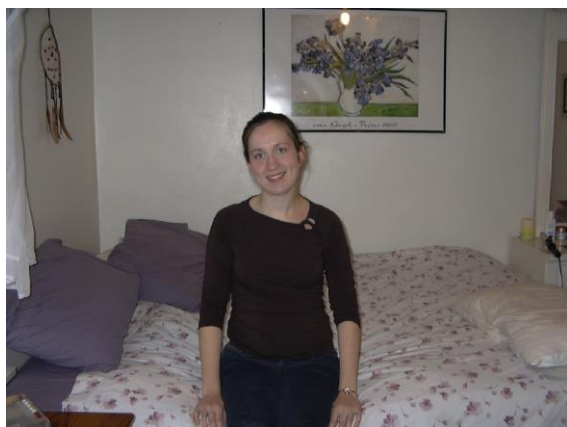
1. Position yourself on the edge of the bed.
2. Once at the edge of the bed, make sure you are in a side laying position (as shown on top left of this page).
3. Swing your feet over the edge of bed (as shown in the picture below).



4. Next push up with your arms



5. Push up until you are in a sitting position on the edge of the bed.



Getting Into Bed

Getting into bed are the same steps as getting out of bed, just in opposite order.

1. Sit on the edge of the bed
2. Lower yourself down onto the bed with your arms.
3. Swing feet up onto the bed
4. Lay down in the side lying position

Bathing Tips

- ➡ Place a non-slip bathmat onto the bottom of the tub or shower floor.



- ➡ Use a long handled sponge or razor to decrease reaching and chance of potential falls.



- ➡ Shave while sitting down either on the toilet, in the bathtub or on a shower bench (pictured below) to decrease chance of falling.



- ➡ This shower or bath bench pictured above can be placed and used inside the shower or bath tub.

Getting Into the Bathtub or Shower

- ➡ When getting into the bathtub you should stand with your feet on the red X, pictured below, with your heels and the back of your knees touching the tub.



- ➡ Then you should lower yourself and sit on the edge of the tub marked in the picture with the black line.
- ➡ While seated on the edge of the bathtub swing your feet over the edge of the bathtub and place them inside the tub on the blue square pictured top right of the page.
- ➡ Once your feet are in the bathtub use your arms to lower yourself into the bathtub.
- ➡ When getting out of the bathtub, do the above steps in the opposite order.

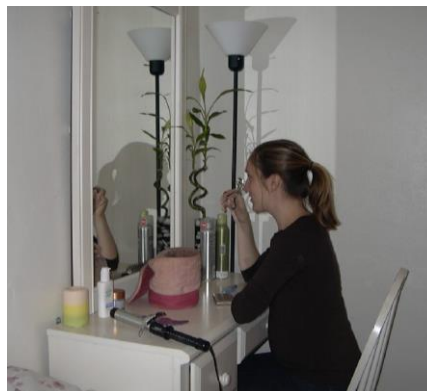


- ➡ When showering you should avoid
 - standing
 - placing one foot up to shave
 - leaning forward

*** These activities may increase your chance of falling.

Tips for Fixing your Hair and Make-Up

- ➡ Use a hand-held mirror or a mirror which sits on the counter top to decrease the need to lean forward to see yourself.



- ➡ Sit down to put on make-up or comb your hair this helps lessen the stress load on your body and also decreases the need for leaning forward while standing.
- ➡ **STANDING:** if standing is the only way to put on make-up or to comb your hair, make sure to have one hand on the counter for balance and one foot up on a stool to decrease the strain on your back.

Reference:

Poole, J.L. (1998). Body mechanics during daily tasks to reduce back pain in women who are pregnant. *Work*, 10, 157-165.

Sexual Activity

Sexual activity with your partner during pregnancy is an important part of your life. There are different positions and methods to assist you in continuing this area of your life. If you are unable to be involved in sexual activity, other intimate options are described in this section.

Positioning

- ➡ Lie on your side with your partner behind you
- ➡ Place yourself on your hands and knees and your partner can kneel behind you
- ➡ You on top of your partner
- ➡ You sitting on your partner's lap

***Remember there is more blood flow to your pelvis area during pregnancy and this increases sensitivity. Sexual activity with penetration may not be needed to stimulate you because of increased sensitivity in this area.

Other Options

- ➡ Intimate cuddling
- ➡ Full body massage
- ➡ Sensual touching
- ➡ Shallow penetration during intercourse

***Remember intercourse and intimacy doesn't need to stop during pregnancy, it may just need to be modified. The above list includes a small number of ideas, you and your partner may find other ways to pleasure each other.

Reasons to Stop Sexual Activity

- ➡ Any type of pain (for example: nausea and breast tenderness, vaginal soreness)
- ➡ Feeling tired or worn out
- ➡ Back pain
- ➡ High risk pregnancy
- ➡ If your doctor says "No!"

References:

Gardos, S. (1999, September). Sex during pregnancy: A time of excitement and intimacy. *Web MD*. Retrieved October 18, 2003, from <http://www.ucsfhealth.org/childrens/edu/pegsex.html>

Chescheir, N.C., Dattel, B.J., Lurvey, N.L., Meade, S.F., Ramin, S., Riley, L.E. et. al. (2000). *Planning your pregnancy and birth* (3rd ed.). Washington, D.C.

Instrumental Activities of Daily Living (IADLs)

Household Tasks

Doing household tasks such as cooking and clean-up, making a bed and doing laundry can be difficult when you are pregnant. As you reach the later stages of pregnancy and your stomach becomes enlarged your center of gravity changes. This gravity change often causes instability when leaning or reaching and can cause falls. The following section gives you tips and ways to complete the tasks with the least amount of difficulty and potential for falls.

Tips for Making a Bed

- ➡ Raise the height of the bed to decrease the need to bend forward when making the bed.
- ➡ Raising the bed can be done by placing blocks of wood under the legs of the bed.
- ➡ You can use a half kneel position to tuck in the corners of the bedding. The half kneel position is demonstrated in the picture below.



- ➡ You can use the ONCE AROUND THE BED METHOD. This is where one side of the bed is made all the way before moving to the other side of the bed. (Pictured at the top right of this page).



- ➡ You can also leave the bed unmade in the last trimester when your abdomen becomes too large.

Laundry Tips

- ➡ To avoid lifting, place laundry basket on dryer or table when loading and unloading the washer.
- ➡ Use a long-handled reacher to get wet clothing out of a top loading washer (shown below).



- ➡ An ideal laundry room includes a side by side washer and dryer. This provides the least amount of bending and twisting.



- ➡ If using a front loading washer or dryer, sit on a chair to remove laundry to avoid bending and reaching forward.



- ➡ Do **NOT CARRY** the laundry basket if it is over 25 pounds. Use a wheeled cart to move the laundry, have someone else carry the laundry, or make several trips, carrying lighter loads.

» Remember **not to carry** anything **over 25lbs** during pregnancy. The additional weight puts too much added stress on your body and your baby.

Cooking and Clean-up

- ➡ While standing to wash dishes or cook meals you should place one foot up on a small stool or in the cupboard (pictured below).



- ➡ Remember to change the foot on the stool or cupboard about every 5-10 min.

***Placing one foot on a stool or cupboard decreases the curve in the back and eases back pain.

- ➡ Take regular sitting breaks, for example, sit when waiting for water to boil.
- ➡ Bring things you are working on as close to the edge of the counter so you do not bend and reach.



- ➡ Use front burners on the stove to avoid reaching.
- ➡ Use a wheeled cart to move items around the kitchen so you do not have to lift and carry them.



Reference:

Poole, J.L. (1998). Body mechanics during daily tasks to reduce back pain in women who are pregnant. *Work*, 10, 157-165.

Cleaning

Cleaning takes a large amount of your time and energy and sadly cannot be stopped for the nine months you are pregnant. In this section tips and techniques are described to help you continue cleaning without using all your energy and to keep you from hurting yourself or your unborn baby.

Dusting & Cleaning

- ➡ Remember to always face the object being cleaned; do not twist your body.



- ➡ Long handled feather dusters can be used to reach tall surfaces. Do not use a stool or ladder because it increases your chance of falling.
- ➡ Make sure to have good air ventilation when using chemicals.
- ➡ Hold on to a sturdy object or wall for support if necessary to lean or bend forward.
- ➡ Kneel down or sit to clean low objects. **Do not stoop or bend at the waist.**

- ➡ Use your **RIGHT** hand to clean the **RIGHT SIDE** of an object and your **LEFT** hand for the **LEFT SIDE** of an object. Do not twist your body.



- ➡ If possible, get someone else to clean hard to reach areas such as windows or the bathtub in later stages of pregnancy.

Vacuuming & Sweeping

- ➡ Keep one foot in front of the other about shoulder width apart. Do not bend forward to reach places; instead move your entire body.





- ➡ Use your feet and legs to move the vacuum rather than pushing, pulling and reaching with your arms.
- ➡ When vacuuming or sweeping under furniture, bend at the knees and squat down rather than bending and leaning forward.

Reference:

Poole, J.L. (1998). Body mechanics during daily tasks to reduce back pain in women who are pregnant. *Work*, 10, 157-165.

Care of Others

Not everyone who is pregnant has other children at home to care for, but you may at sometime during your pregnancy need to care for children. Even if you are pregnant with your first child these tips for caring for others may be helpful once your baby is born and will surely be useful if you plan to have a second child. If you are pregnant with your second child or work with children while you are pregnant this section will offer you tips and techniques to care for your child. The tips and techniques in this section offer you ways to complete caring task using less energy and lessen the chance of hurting you or your unborn baby.

Lifting a Child

- ➡ When possible, you should sit on a chair and have the child crawl up onto your lap using a stool (pictured below). Once the child is on your lap you should stand up with the child holding him/her as close to your body as possible.



Putting a Child into a Highchair

- ➡ Closely watch the child and allow him or her to climb into the highchair by themselves; using a stool or a chair so you do not have to lift them.

Putting a Child into a Car Seat

- ➡ An easy way to get your older child into his or her car seat is to allow them to climb into the car seat by themselves with supervision and close contact. This method is used to avoid bent over lifting.
- ➡ Place car seat near the door to avoid extreme forward bending to reach to the middle of the car.
- ➡ You should squat next to the car to fasten the seatbelt or sit next to the car seat inside the car to avoid twisting and reaching.
- ➡ Another option to avoid twisting is to buy a swiveling car seat.

Bathing a Child

In a bathtub (if your child is old enough)

- ➡ You can kneel beside the tub, facing the child squarely. Try not to twist your body.
- ➡ If possible, have your child crawl into and out of the bathtub to avoid lifting your child.

Bathing a Child

In the Kitchen Sink

- ➡ If the child is small enough bathing in the kitchen sink is an option to avoid bending forward. This way the task is at the right height.
- ➡ A final option for bathing a child is to use an infant bathing tub on a table until they grow to large to fit into the infant bathing tub.

Dressing a Child

- ➡ To save energy, get all the supplies you will need and put them in one place before you start dressing your child.
- ➡ To avoid bending forward, have the child stand or lie on a bed while dressing. When using this technique, safety is a concern, since the child could fall off the bed.

Reference:

Poole, J.L. (1998). Body mechanics during daily tasks to reduce back pain in women who are pregnant. *Work*, 10, 157-165.

Exercise

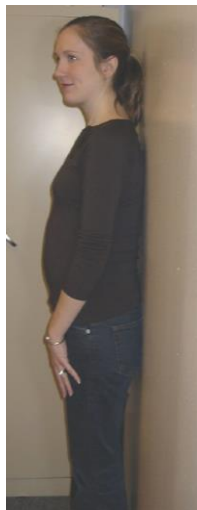
First, talk to your doctor about exercise and decide if this is an option for you.

Exercising during pregnancy is safe and has benefits. Benefits of exercise include: better control of blood sugar levels, less weight gain, it lessens the risk of gestational diabetes, improves emotional status (With physician approval..., 1994), shortens labor length, less difficulties are noted with labor pain and less medical involvement (Schramm, Stockbauer & Hoffman, 1996). In this section there are different types of exercises you can do to strengthen your back, stomach and legs to help lessen or prevent back pain.

Pelvic Tilt

Pelvic Tilt Against a Wall

- ➡ Stand with back against a wall, feet shoulder width apart, knees slightly bent, weight on heels.



- ➡ Inhale...exhale and squeeze stomach muscles and bottom, relax lower back, bring hips backwards so lower part of back is flat to the wall. Hold for 3 seconds.

- ➡ Check to see if you have the correct position by trying to slide a hand between the back and the wall.

- ➡ Do this 15-20 times

- ➡ 2 times each day

Pelvic Tilt with Back on Floor (second option of pelvic tilt exercise)

- ➡ Lie on back, knees bent, shoulders and bottom on the floor. Rotate hips back so lower back touches the floor.
- ➡ Hold for 3 seconds....relax.
- ➡ Do this exercise 15-20 times; 2 times each day.

Back Lying Curl Ups

- ➡ Sit on the floor, knees slightly bent, heels on the floor



- ➡ Reach hands out in front of you



- ➡ Lean back until at a 45° angle to the floor

- ➡ Exhale

- ➡ With control, slowly roll back up to sitting

- ➡ Do 10 curl ups each day



*** Before doing stomach exercises, have your physician look for splitting in the middle of your stomach muscles. Splitting may occur if the baby grows too fast and stomach muscles are weak. Do not do exercises if stomach muscles are split***

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Do your shoulders ache? Do your arms tingle or feel numb at times? Try these exercises.

Shoulder Roll

- ➡ Sit on the floor or on a chair
- ➡ Place fingers on shoulders
- ➡ Move elbows back in a circle
- ➡ Change directions
- ➡ Do 10 circles each way
- ➡ Do exercise 2 times each day



Thought you could skip out on squats while pregnant? No way! Try these...

Modified Squats

- ➡ Sit against a wall with legs at about a 45° angle (look at upper legs in picture)
- ➡ Slowly move body up and down along wall
- ➡ Do this 20 times
- ➡ Do squats 2 times each day



The Hip Flexor Stretch

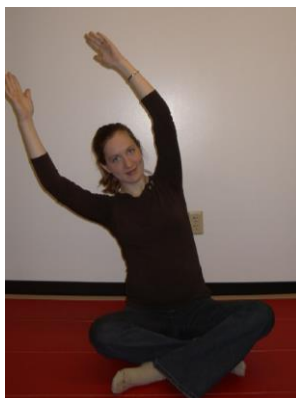
- ➡ Place one knee on the floor with the other foot on the floor; knee bent



- ➡ Hold this position for 30 seconds; feeling a stretch along front of upper leg
- ➡ Complete 2xs per day

The Side Stretch

- ➡ Raise your arms overhead
- ➡ Reach up and stretch to each side
- ➡ Sit against a wall to avoid arching the back
- ➡ Complete 5 slow stretches; 2xs per day



Reasons NOT to Exercise During Pregnancy

- ➡ Heart disease
- ➡ Lung disease
- ➡ Soft cervix/cerclage (when your cervix is stitched closed to prevent preterm delivery)
- ➡ Expecting twins (is a risk of early delivery)
- ➡ Continuous second or third trimester bleeding
- ➡ Placenta praevia (when the placenta shows first, delivering before the baby) after 26 weeks of being pregnant
- ➡ Split or ripped membranes
- ➡ High blood pressure caused by pregnancy

References:

- Jacobson, H. (1991). Protecting the back during pregnancy. *AAOHN Journal*, 39(6), 286-291.
- Artal, R., O'Toole, M. (2003). Guidelines of the american college of obstetricians and gynecologists for exercise during pregnancy and the postpartum period. *British Journal of Sports Medicine*, 37, 6-12.
- Cannon, R.B., Schmidt, J. V., Cambardella, B. & Browne, S. E. (Sept, 2000). High risk pregnancy in the workplace. *AAOHN Journal*, 48(9), 435-449.
- Schramm, W.F., Stockbauer, J.W. & Hoffman, H.J. (1996). Exercise, employment, other daily activities, and adverse pregnancy outcomes. *American Journal of Epidemiology*, 143(3), 211-218.
- With physician approval, pregnant women can still exercise. *OT Week*, February 3, 1994

Work

The workforce in the United States is composed of 46% women, of these, 68% are of childbearing age (Cannon, Schmidt, Cambardella & Browne, 2000). There are federal laws to protect pregnant women while working. The federal laws include: pregnancy discrimination act, occupational safety and health act and family and medical leave act. You should be familiar with these laws and your legal rights. Information about these laws can be found in the book *Planning Your Pregnancy and Birth 3rd Edition* (Chescheir, et. al., 2000) and also on the World Wide Web at <http://www.4women.gov>. The following section describes several ways to change your work area if needed and how you should appropriately move about it.

Sitting Posture

Suggestions:

- ➡ Choose a firm, chair with arm rests
- ➡ Lower back support
- ➡ Foot stool

****Having a lower back support and a foot stool help to give the lower back its natural curve****

- ➡ If you must sit for a long time, stand and move about the office or home every 30-40 minutes.



Wrong Position – when coming up to stand from a chair

Standing From a Chair

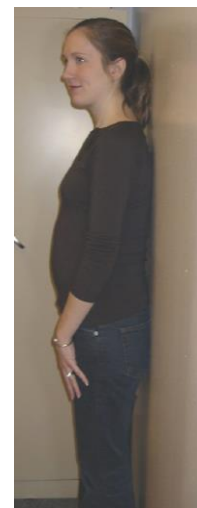
- ➡ Use your arms to push off the arm rests of a chair to help you stand.



Right Position

Standing Posture

- ➡ Weight evenly spread on both feet
- ➡ Bottom tucked under
- ➡ Chin down
- ➡ Shoulders back
- ➡ Ribcage flat
- ➡ Flat back
- ➡ Knees bent



Work surface heights

- ➡ 2-4 inches below elbow for easy tasks
 - ➡ 4-8 inches below elbow for hard tasks
- *****DO NOT stand** for long periods of time; if you must, **remember to...**
- ➡ Put one foot on a stool in front of you, flexing the hip and knee (this decreases the weight on the lower back)
 - ➡ Change positions often

Getting Into a Car

- ➡ Stand so the back of your legs are touching the car.



- ➡ Sit down on the car seat.



- ➡ Next, swing your feet into the car, one at a time.



Sitting in the Car

- ➡ Once in the car make sure the seat belt is fastened under the stomach and across the hips.
- ➡ Slightly recline the seat (100° - 110°)



Computer Use

Your **Monitor** should be...

- ➡ Placed in front of you (not to the right or left)
- ➡ Positioned with the top of the monitor being 2-3 inches above your eyes
- ➡ Arm's length away
- ➡ Glare free (use an anti-glare filter or an LCD display)



The **Keyboard** should be...

- ➡ On a keyboard/mouse tray
- ➡ Close to you
- ➡ Centered (use the B key as a center point of reference)
- ➡ Tilted down for better wrist posture (wrists should be as flat and straight as possible)

The **Mouse** should be...

- ➡ At a distance where your upper arm is relaxed, not overstretched or too close
- ➡ Angle at elbow should be greater than 90° to avoid pinching of the nerves

The **Desk** should be...

- ➡ Stable
- ➡ 28-30 inches above the floor

The **Chair** should have...

- ➡ 100-110 degrees of recline for supporting your back
- ➡ Lumbar support
- ➡ Changeable height option so feet can be placed flat on the floor or on a footrest

Body Position should be...

- ➡ Head and neck in alignment; as straight as possible.
- ➡ Elbows and upper arms at or greater than 90 degrees to stay away from elbow nerve compression
- ➡ Relaxed as possible

Remember to...

- ➡ Take eye breaks – every 15 minutes (look 20 feet away to relax eye muscles; blink rapidly to refresh the tear film and clear dust from your eye's surface)
- ➡ Take rest breaks every 30-60 minutes – stretch, walk around, get a drink of water, rest hands making sure they are flat and straight.

Fun option!

Setup a program on your computer to remind you to stretch and take rests from either site:

www.aota.org/nonmembers/area18/links/link01.asp

OR

www.magnitude.com

***These programs will remind you to take rest breaks and list exercises and stretches to do during the day.

References:

Cannon, R.B., Schmidt, J.V., Cambardella, B., & Browne, S. E. (Sept, 2000). High risk pregnancy in the workplace. *AAOHN Journal*, 48(9), 435-449.

Chescheir, N.C., Dattel, B.J., Lurvey, N.L., Meade, S.F., Ramin, S., Riley, L.E. et. al. (2000). *Planning your pregnancy and birth* (3rd ed.). Washington, D.C.

Hedge, A. (2003). Ergonomic guidelines for computer workstations – 10 steps for users. Retrieved 8/20/03 from <http://www.spineuniverse.com/displayarticle.php/article1410.html>.

Poole, J.L. (1998). Body mechanics during daily tasks to reduce back pain in women who are pregnant. *Work*, 10, 157-165.

Tapp, L. M. (2000). Pregnancy and ergonomics. Retrieved 8/20/03 from <http://www.crownsafety.com/Pregnancy.pdf>.

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General Guidelines

This section covers guiding principles, recommendations, employer concerns, support for your significant other and places to look for more information. This information and guidelines can be used when doing a variety of activities, both when pregnant or not pregnant. This packet does not cover everything you may need to know when pregnant. Therefore, a list of other places to find information is included in the section “Places to Look for More Information.”

Guiding Principles

- ➡ Decrease hard work
- ➡ Limit lifting to 25 pounds
- ➡ Do fewer tasks
- ➡ Change working hours
- ➡ Limit standing still for long periods of time; limit standing to 3 hours per day, with breaks
- ➡ Use foot rests while standing and sitting; alternate the foot being raised
- ➡ Change the height of your chair and table or work surface to a comfortable height. While standing, do tasks at a table 2-4 inches below the elbow
- ➡ Take more frequent and shorter breaks during the day
- ➡ Change positions often
- ➡ Do not use ladders or stepstools
- ➡ Do not touch or be around chemicals, chemotherapy agents, lead-based paint and pottery, smoke, bodily fluids, excrement and raw meat
- ➡ Always use gloves when using chemicals. For example dusting spray, bleach and other cleaning supplies

Recommendations: Ways to Improve High Risk Pregnancies

- ➡ Talk with your physician and follow his or her recommendations.
- ➡ Be aware of risk factors
- ➡ Change working conditions – reduce working hours, use scheduled rest periods, assign less demanding tasks to those pregnant
- ➡ Talk to health care workers
- ➡ Become familiar with the Family and Medical Leave Act – this act allows 12 weeks unpaid leave, benefits, and the same or equal job upon return to work

Employer Concerns for the Pregnant Worker

- ➡ Be in favor of a non-smoking, pleasing setting (for example having break rooms, soft lighting, and plants)
- ➡ Put up health promotion handouts
- ➡ Give classes at the jobsite (for example pregnancy nutrition, breastfeeding, lower back pain, and ergonomics)

- ➡ Start wellness and health classes (for example, how to control your stress, yoga, exercise, massage therapy, and walking programs)
- ➡ Display community resources for more help

Providing Support for the Significant Other

- ➡ Make resources available – support groups, counseling
- ➡ Offer flexible work schedules
- ➡ Provide education before, after, and following pregnancy

Conclusion

- ➡ Staying healthy will decrease high risk pregnancies
- ➡ Good positioning will help to decrease fatigue, labor before the due date, and lower back pain
- ➡ Education in good positioning may increase your ability to work longer hours at home and at the work place.

- ➡ Journal articles show that mood is increased when you are able to be independent and do daily work and leisure tasks while pregnant.
- ➡ By using the recommendations in the packet pregnant women and their employers may see and increase in hours worked. Pregnant women can then continue to be productive at home and work.

Places to Look for More Information

American College of Obstetricians and Gynecologists (ACOG)

1-800-762-2264

<http://www.acog.org>

National Women's Health Information Center (NWHIC)

1-800-994-WOMAN

<http://www.4women.gov>

Journal of Obstetric, Gynecologic and Neonatal Nursing (JOGNN)

1-800-638-3030

<http://www.nursingcenter.com>

National Perinatal Association

1-813-971-1008

<http://www.nationalperinatal.org>

Healthy Mothers, Healthy Babies Coalition (HMHB)

1-703-836-6110

<http://www.hmhb.org>

References:

Artal, R., O'Toole, M. (2003). Guidelines of the american college of obstetricians and gynecologists for exercise during pregnancy and the postpartum period. *British Journal of Sports Medicine*, 37, 6-12.

Cannon, R.B., Schmidt, J. V., Cambardella, B. & Browne, S. E. (Sept, 2000). High risk pregnancy in the workplace. *AAOHN Journal*, 48(9), 435-449.

Tapp, L. M. (2000). Pregnancy and ergonomics. Retrieved 8/20/03 from [www.crownsafety.com/](http://www.crownsafety.com/Pregnancy.pdf) Pregnancy.pdf.

